JCP&L
Comments Regarding Stray Voltage/Ground Current Investigation & Final Assessment Performed by VitaTech Engineering

VitaTech Engineering recommended the following:

1. Oversize primary neutrals on Lines 80, 81, 82 and 83 (estimated cost: $250,000) as specified in *Figure #12, Recommended Upgrade To Primary Neutrals* to match the size and impedance of the 397AA phase conductors. A total of 37,600 feet (7.12 miles) of upgraded 397AA primary neutrals are recommended to mitigate the stray voltage problem and achieve a neutral-to-earth voltage of 4-5 volts during the summer months on the substation grid and down-grounds of the adjacent neighborhoods during peak summer loads. Specific routes and circuit length details for the recommended upgraded primary neutrals are provided in Figure #12; however, selected lateral circuits may also require upgraded 397AA neutrals to achieve the 4-5 volt summer performance objective including Azalea Drive, Truman Drive, Harding Drive, Roosevelt Drive and Old Squan Drive.

   The consultant's report does not quantify the expected results by use of a mathematical model.

   JCP&L intends to oversize the system neutral in the near future, using a methodical approach. Each circuit will initially have 2000 feet of 397.5 AA primary neutral added, and the associated affect documented. Additional footage in 2000-foot increments will be added to obtain the 4 to 5 volt range. This should provide maximum results faster to those customers that are most affected.

2. No additional ground rods, mats or plates are recommended for the substation ground grid; however, the substation ground plate should be expanded to the extents of the new fence line with additional grounds bonded from the grid to the fence, where needed. (Note: This will have no adverse effect on stray voltage.)

   JCP&L will implement the extension of the grounding grid to the extent of the new fence as noted. It is understood that this work will have no effect on the mitigation of stray voltage and is being done to comply with our standard grounding practices.

3. Balance the phases on Lines 80, 81, 82, and 83 to within 10% (as measured by the SCADA equipment at the substation) during average loads (20-25%) and no more than 15% during peak summer loads to minimize zero-sequence currents.

   JCP& L recognizes that balancing distribution circuits is a continuous process due to varying load characteristics. Our last in-depth, comprehensive study indicated that the circuits were balanced, operating within 10-19%. We are committed to carrying out the recommendation of further balancing the circuits. We anticipate completion within a 3-week time frame.

Miscellaneous Comments

- **Report states that neutral size consists of only #4Cu and #2 ACSR. The circuits out of Herbertsville actually have a mix of #2 ACSR and #2/0 AA as neutral conductors.**
- **Reconductoring of the circuit neutrals will be initiated expeditiously. This work will be performed once the referenced balancing is completed.**